

CLAIMS

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1. An apparatus for curing a coating on an object, in particular a vehicle body, said coating consisting of a material which cures under electromagnetic radiation, in particular of a UV-curing paint or a
5 heat-curing paint, having

- a) at least one radiation emitter producing electromagnetic radiation;
- b) a conveyor system, which conveys the object into the vicinity of the radiation emitter
10 and away again therefrom;

characterised in that the conveyor system (3; 103) comprises:

- c) at least one transport carriage (18; 118), which may be displaced translationally on at
15 least one running surface (15, 16; 115, 116) and comprises:
 - ca) a drive motor (22; 122) for the translational movement;
 - cb) a support frame (26; 126), to which
20 the object (4; 104) may be attached

5 and which may be pivoted or swivelled independently of the translational movement about a pivot or swivel axis extending perpendicularly to the direction of the translational movement.

10 2. An apparatus according to claim 1, characterised in that the transport carriage (18; 118) comprises at least one arm (24; 124), to the outer end of which the support frame (26; 126) is attached in pivotable or swivellable manner and which may be pivoted or swivelled at its opposing, inner end about a second pivot or swivel axis (23; 123).

15 3. An apparatus according to claim 1 or claim 2, characterised in that the transport carriage (18; 118) may be moved on two parallel running surfaces (15, 16; 115, 116).

20 4. An apparatus according to any one of claims 1 to 3, characterised in that it comprises a container (2; 102) open towards the conveying plane of the conveyor system (3; 103), it being possible to introduce the object (4; 104) into the interior of said container by pivoting or swivelling the support frame (26; 126) and to expose said interior to electromagnetic radiation from at least one radiation emitter (12; 112).

5. An apparatus according to claim 4, characterised in that at least one radiation emitter (12) is installed in a wall (8 to 11) or the floor (5) of the container (2).

5 6. An apparatus according to claim 5, characterised in that at least one radiation emitter (12) is arranged in the opposing side walls (8, 9) extending parallel to the translational movement of the objects (4) and at least in one of the two end 10 walls (10, 11) extending perpendicularly to the translational movement of the objects (4) or in the floor (5) of the container (2).

7. An apparatus according to claim 5, characterised in that a plurality of radiation emitters (12) is arranged on all the walls (8 to 11) and in the 15 floor (5) of the container (2).

8. An apparatus according to any one of the preceding claims, characterised in that a plurality of radiation emitters (112) are provided in a U-shaped 20 arrangement with two substantially vertical legs and a substantially horizontal base.

9. An apparatus according to claim 8, characterised in that the approximately vertical legs of the U-shaped arrangement of radiation emitters (112) are

adapted to the profile of the lateral contour of the objects (104).

10. An apparatus according to claim 8, characterised in that the approximately vertical legs of the U-shaped arrangement of radiation emitters (112) are segmented and the segments are adjustable relative to one another.
11. An apparatus according to any one of claims 8 to 10, characterised in that the base of the U-shaped arrangement of radiation emitters (112) is adapted to the profile of the contour of the objects (104).
12. An apparatus according to any one of claims 8 to 10, characterised in that the base of the U-shaped arrangement of radiation emitters (112) is segmented and the segments are adjustable relative to one another.
13. An apparatus according to any one of claims 4 to 12, characterised in that a protective gas may be fed to the interior of the container (2; 102).
- 20 14. An apparatus according to claim 13, characterised in that the protective gas is heavier than air, in particular it may be carbon dioxide, and the container (2; 102) is open at the top.

15. An apparatus according to claim 13, characterised in that the protective gas is lighter than air, in particular it may be helium, and in that the container (2; 102) is constructed as a hood open at the bottom.
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16. An apparatus according to any one of claims 13 to 15, characterised in that the protective gas is at the same time a cooling gas for the radiation emitters (12; 112).
- 10 17. An apparatus according to any one of claims 13 to 16, characterised in that a device is provided which directs the protective gas towards the surface zone of the object (4; 104) exposed to the radiation emitter (12; 112).
- 15 18. An apparatus according to any one of the preceding claims, characterised in that a device is provided which blasts the object with a directed protective gas stream prior to entry into the radiation field of the radiation emitter or the protective gas atmosphere.
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19. An apparatus according to any one of the preceding claims, characterised in that a mobile reflector is associated with at least one radiation emitter (12; 112) on the side remote from the object (4; 104).

20. An apparatus according to any one of claims 4 to 19, characterised in that the container (2; 102) is lined with a reflective layer.

21. An apparatus according to claim 20, characterised in that the reflective layer consists of aluminium foil.

22. An apparatus according to claim 21, characterised in that the aluminium foil comprises a plurality of uneven areas, for example is creased.

10 23. An apparatus according to any one of the preceding claims, characterised in that it comprises a booth housing (27; 127), which prevents uncontrolled escape of gases and electromagnetic radiation.

15 24. An apparatus according to claim 23, characterised in that an airlock (50, 70) is provided for the transport carriage (18) at each of the in- and outlet of the booth housing (27).

20 25. An apparatus according to claim 23 or claim 24, characterised in that a device (90) is provided for removing the oxygen from the atmosphere inside the booth housing (27).

26. An apparatus according to claim 25, characterised in that the device for removing the oxygen

comprises a catalyst for catalytic binding of the oxygen.

27. An apparatus according to claim 25 or claim 26, characterised in that the device for removing the oxygen comprises a filter for absorbing oxygen.
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28. An apparatus according any one of claims 25 to 27, characterised in that the device for removing the oxygen comprises a filter for adsorbing oxygen.
29. An apparatus according to any one of the preceding claims, characterised in that it comprises a preheating zone (40) for removing solvent from the coating material.
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30. An apparatus according to any one of claims 1 to 28, characterised in that it comprises a preheating zone (40) for gelling pulverulent coating material.
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31. An apparatus according to any one of the preceding claims, characterised in that a measuring station (55) is mounted upstream of the at least one radiation emitter (12) in the conveying direction, said measuring station being used to detect the three-dimensional shape data of the object (4).
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32. An apparatus according to claim 31, characterised in that the measuring station (55) comprises at

least one optical scanner, by which the object (4) may be scanned at least in one spatial direction.

33. An apparatus according to claim 32, characterised in that the optical scanner comprises an infrared light source.

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34. An apparatus according to claim 31, characterised in that the measuring station (55) comprises a video camera and a device for digital imaging.

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35. An apparatus according to any one of claims 31 to 34, characterised in that the data obtained from the measuring station (55) may be stored in a control device (56), which reads these data out again during subsequent movement of the object (4) past the at least one radiation emitter (12) and uses 15 them to control the movement of the object (4).

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36. An apparatus according to any one of claims 31 to 34, characterised in that the measuring station is arranged in the immediate vicinity of the at least one radiation emitter and a control device is provided, which uses the data obtained from the measuring station without a time delay directly to control the movement of the object.

37. An apparatus according to claim 36, characterised in that the measuring station comprises at least one light barrier.

38. An apparatus according to any one of the preceding 5 claims, characterised in that a control device is provided in which the three-dimensional shape data associated with a specific type of object may be stored and retrieved therefrom if required.

39. An apparatus according to any one of the preceding 10 claims, characterised in that a plurality of radiation emitters are provided in irregular arrangement.

40. An apparatus according to any one of the preceding 15 claims, characterised in that the electromagnetic radiation is UV light.

41. An apparatus according to any one of the preceding claims, characterised in that the electromagnetic radiation is IR light.